## Space Weather Forecast

Issued on Monday, 15 January 2024 at 13:28 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

**Space Weather Forecast Headline: Chance of Moderate-class X-ray flares.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity is at Low levels, with the largest flare of the period peaking at 14/1206UTC, attributed to an Ex-sunspot beyond the northwestern limb. There are currently twelve sunspots on the visible disc. A complex region in the southwest which has developed slightly, with a number of new spots appearing in the intermediate region. Another in the southeast still consists of a large leader spot, with trailing spots showing some minor growth and magnetic complexity. There is a spot still emerging around the eastern limb, this now appears larger and bipolar, though analysis of this spot is currently difficult due to foreshortening. All other regions appear to be small or simple.

No coronal mass ejections (CMEs) observable on coronagraph imagery over the past 24 hours are expected to have an Earth-directed component.

**Solar Wind / Geomagnetic Activity:** Solar wind parameters, as observed by DSCOVR at L1, have been at background levels. Solar wind speeds have been slow/ambient. The interplanetary magnetic field (IMF), Bt, has been weak throughout. The north-south component, was weak and mostly negative. Geomagnetic activity was Quiet (Kp 1-2).

**Energetic Particles / Solar Radiation:** Solar radiation was at background levels, with no solar radiation storms observed.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** There is a chance of isolated Moderate-class activity and a slight chance of Strong flares.

**Solar Wind / Geomagnetic Activity:** No Earth-directed coronal mass ejections currently feature in the forecast. A coronal hole high speed stream may bring slightly elevated wind speeds day 2 (16 Jan) or into day 3 (17 Jan), with the effects waning into day 4 (18 Jan).

Overall, geomagnetic activity is likely to be Quiet (Kp 0-2), but with a chance of Unsettled to Active (Kp 3-4) intervals days 2 or 3 (16-17 Jan) should we see any coronal hole high speed stream influence.

**Energetic Particles / Solar Radiation:** Solar radiation is expected to persist at background levels. Although, there remains an ongoing slight chance of seeing an increase to the S1/Minor Radiation Storm threshold, should any notable flares occur.

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 1 | 5 | 5 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 40 | 40 | 40 | 40 |
| Very Active | R3 to R5 X | No | 5 | 5 | 5 | 5 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 5 | 5 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |
| * S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$) | | | | | | |

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